

13" Broadcast color monitor
BVM-1310
(NTSC)



Sony
Broadcast

SONY®

In recognizing a wide diversity of viewing requirements within today's Broadcast and production environments, Sony has systematically developed a broad and flexible range of color monitors. Each are tailored with a specific performance capability and have features to optimally address specific applications.

The BVM-1310 High Performance Color Monitor is designed for precise evaluation of video signal.

With the adoption of Fine Pitch, One-gun 3-beam Aperture Grille CRT and with the advanced circuit technology, the BVM-1310 realized 700 TV line center resolution and the stabilization of color temperature. With the BVM-1310 Monitor, maximum of 3 TV standard systems out of 4 TV standard systems (NTSC, PAL, SECAM, PAL-M) can be used in any required combination using optional plug-in type decoder boards.

The BVM-1310 also provide built-in cross hatch and white signal generator for easy maintenance and component input/output facilities to expand system flexibility.

The BVM-Series are top of the broadcast quality monitors for critical video evaluation.

Features

- Using optional decoder boards (plug-in type), maximum of 3 TV standard systems can be selected in the drawer.
- Stabilized color temperature is obtained by employing newly developed beam control circuit.
- Unique picture set-up switch facilities as an adjustment for accurate incoming video level alignment.
- Up to 6dB aperture correction at 4.5MHz and 6.5MHz selectable.
- Pulse Cross function is provided to check the horizontal and vertical syncs simultaneously.
- Built-in cross hatch and white signal generator (100 IRE) for easy monitor alignment.
- Optional component (RY, Y, BY) and R, G, B input/output facilities.
- Split screen (vertical only) for precise picture confirmation.
- VITC display facility (option)
- Blue only mode with B/W display to evaluate noise component precisely.
- Two lockable pull-out drawers give access to convergence, color balance, level adjustment and other controls.
- Comb Filter (NTSC), Notch Filter (PAL)
- Equipped with Auto/Manual Degaussing.
- Provides EBU and US standard phosphors to meet customers' requirement.
- The AFC switch provides fast and slow mode.
- Over Drive Protection circuit protects against picture tube damage.
- Fine Pitch CRT assures center resolution of 700 TV lines at 40 fL.
- 19-inch rack mountable
- Raster size stability within 1% from 0 to 40 fL.
- Precise convergence, less than 0.3mm at center and 0.6mm at edge of area.

Front Panel



Specifications

1. CRT PERFORMANCE

1.1 CRT Type: Fine Pitch In Line Stripe Grille
Aperture Grille (AG) pitch: 0.25mm
Center resolution: 700 TV lines

1.2 Screen Size: Diagonal; 33.58cm (13.22")
Width: 26.86cm (10.57")
Height: 20.15cm (7.93")

1.3 Chromaticity Coordinates:

EBU Standard phosphors

	x	y	u	v
RED	0.64	0.33	0.451	0.349
GREEN	0.29	0.60	0.121	0.374
BLUE	0.15	0.06	0.175	0.105

Tolerance = ± 0.005

US Standard phosphors (NTSC only)

	x	y	u	v
RED	0.630	0.340	0.433	0.351
GREEN	0.310	0.595	0.130	0.375
BLUE	0.155	0.070	0.176	0.119

Tolerance = ± 0.005

1.4 Color Temperature:
D 6500°K white (adjustable)

1.5 Color Temperature Stability:

Differential variations between, Red, Green, and Blue screens are less than 1% over 500 hour period. This high level of stability is guaranteed by the novel Beam Feedback Control system employed to stabilize CRT black level.

1.6 Preset Brightness Range: From below cut off to 1.5 fL

1.7 Maximum Brightness: More than 80 fL

1.8 Preset Contrast: 40 fL (at 100% white)

1.9 CRT Protection: High voltage is automatically switched off if either scans fail. A warning lamp on the front panel lights if the CRT is driven beyond preset limits.

1.10 Degaussing: Manual push button and automatic

1.11 Warm Up Period:
30 minutes to meet specifications.

2. RASTER and PICTURE PERFORMANCE

2.1 Normal Scan:

4 x 3 Aspect Ratio, Blanked raster $< +5\%$,
Raster size has internal adjustment

2.2 Underscan:

4 x 3 Aspect Ratio Approx. -10%, Picture and blanking boundaries displayed, Underscanned raster has additional internal adjustments.

2.3 Stability of Raster Size:

1% of picture height for a 0 to 100% APL change when 100% peak white set to 40 fL brightness.

2.4 Linearity of center H & V lines:
0.5% of the picture height

2.5 Geometry (all over screen):
1% of the picture height

2.6 Convergence:

0.3mm within circle centered on the screen and with a diameter equal to the vertical height.

0.6mm at any other point

2.7 High Voltage: 25kV typical

2.8 High Voltage Regulation:

When set at a beam current of 150 μ A there shall be less than $\pm 0.5\%$ change when the brightness is varied from 0 to 40 fL.

2.9 Hum Fluctuation:

Periodic movement or jitter of the raster is less than 0.2mm (0.07%) for any power hum interference.

3. INPUT FACILITIES

3.1 Video Inputs:

INPUT SIGNAL	SIGNAL LEVEL	INPUT CONNECTOR TYPE
Video A	Composite 1.0Vp-p ± 6 dB Non-composite 0.7Vp-p ± 6 dB	High impedance loop through, two BNCs
Video B	Composite 1.0Vp-p ± 6 dB Non-composite 0.7Vp-p ± 6 dB	High impedance loop through, two BNCs
Red/ RY*	Non-composite 0.7Vp-p ± 6 dB	High impedance loop through two BNCs (each)
Green/ Y/Test*	Composite 1.0Vp-p ± 6 dB Non-composite 0.7Vp-p ± 6 dB	
Blue/ BY*	Non-composite 0.7Vp-p ± 6 dB	
Sync	Negative going 0.5 ~ 8.0Vp-p	High impedance loop through, two BNCs

*Input facility of Test, R, G, B and component (RY, BY, Y) are optional.

3.2 Power Inputs:

3-pin power plug
voltage selector AC 100/120 & 220/240V
 $\pm 10\%$, 140W (typical)
Line frequency 48 to 66Hz

3.3 Control Inputs:

Tally and Remote Control via 10-pin connector

3.4 Input Technical Specifications:

The following specs apply to all video inputs

3.4.1 Return Loss:

More than 46dB, up to 7MHz

3.4.2 Crosstalk (between inputs):

More than 50dB, up to 7MHz

3.4.3 Hum Suppression:

50dB down with up to 4V RMS power hum when in floating ground mode.

4. OUTPUT FACILITIES (OPTIONAL)

Signal	Signal Level	Level if terminated	Connector Type
Red Green Blue	2.0Vp-p	1.0Vp-p, 75 ohms	BNC
RY	PAL/NTSC 0.68Vp-p for 75% Color Bars	—	BNC
	SECAM 0.544Vp-p		
BY	PAL/NTSC 0.5Vp-p for 75% Color Bars	—	BNC
	SECAM 0.4Vp-p		

5. RGB PERFORMANCE

The following specs are measured from the RGB inputs to the input of the final stage CRT video drive amplifier. The specs apply to both 625 and 525 systems and therefore all waveform specs are quoted with 625 test waveforms:

5.1 Frequency Response:

100Hz to 10MHz ± 1.0 dB

5.2 Linear Waveform Distortion:

625 Line T-Step

Line-time waveform distortion; $< 1\%$

Short-time waveform distortion; $< 1\%$

50Hz squarewave

Field-time waveform distortion; $< 1\%$

2T pulse response

2T Pulse to Bar Ratio; $< \pm 0.5\%$ K rating

2T Pulse base line; $< \pm 1\%$ K rating

5.3 Non Linear Distortion:

Line-time non linearity (measured with 5-rise staircases); $< 3\%$

Dynamic gain (for all APL's); $< 3\%$

6. DECODER PERFORMANCE (NTSC/PAL)

6.1 Luminance:

NTSC performance

	WITHOUT NOTCH FILTER	WITH NOTCH FILTER	WITH COMB FILTER
Frequency response	± 1.0 dB 100Hz to 8MHz	-30 dB at 3.58MHz	± 1.5 dB 100Hz to 8MHz
Linear waveform distortion 2T pulse to Bar (525 lines)	$< \pm 1\%$ K	$< \pm 2\%$ K	$< \pm 1\%$ K
2T pulse to baseline (525 lines)	$< \pm 1\%$ K	$< \pm 2\%$ K	$< \pm 1\%$ K
525 T-step	$< 1\%$	$< 1\%$	$< 1\%$
Line time distortion	$< 1\%$	$< 1\%$	$< 1\%$
Short time distortion	$< 1\%$	$< 1\%$	$< 1\%$
60Hz squarewave distortion	$< 1\%$	$< 1\%$	$< 1\%$

PAL performance

	WITHOUT NOTCH FILTER	WITH NOTCH FILTER
Frequency response	± 1.0 dB 100Hz to 8MHz	-30 dB at 4.43MHz
Linear waveform distortion 2T pulse to Bar (625 lines)	$< \pm 1\%$ K	$< \pm 2\%$ K
2T pulse to baseline (625 lines)	$< \pm 1\%$ K	$< \pm 2\%$ K
625 T-step	$< 1\%$	$< 1\%$
Line time distortion	$< 1\%$	$< 1\%$
Short time distortion	$< 1\%$	$< 1\%$
50Hz squarewave distortion	$< 1\%$	$< 1\%$

6.1.1 Non linear distortion:

Line time non linearity; $< 1\%$

Dynamic gain (for all APL's); $< 1\%$

6.2 Aperture Correction:

This can be internally selected to provide one of two modes of operation:

MODE 1 provides continuously adjustable (control on front panel) control of frequency response with up to 6dB boost at 6.5MHz. This control can be employed to compensate for the aperture loss of the CRT.

MODE 2 provides continuously adjustable control of frequency response, with up to 6dB boost at 4.5MHz. This control can be employed for subjective enhancement of the displayed picture.

6.3 Chrominance/Luminance Parameters: NTSC performance

	WITH COMB FILTER	WITH NOTCH FILTER
Chrominance suppression in luminance	>24dB at 3.58MHz	>30dB at 3.58MHz
Luminance suppression in chrominance	>20dB at 3.58MHz	—
Chrominance/Luminance delay	<30nS	<30nS

PAL/PAL-M performance (with notch filter)

Chrominance suppression in luminance:

>30dB at 4.43MHz (PAL)
at 3.58MHz (PAL-M)

Chrominance/Luminance delay: <30nsec.

6.4 Chrominance:

Demodulator axes

RY and BY (90° ±1° relative to each other)

Chrominance bandpass

1.3MHz equiband

Hue regulation

Calibrated position: ±1°

Control range:

±15° (NTSC), ±10° (PAL/PAL-M)

Saturation regulation

Calibrated position: ±3%

Variable range: ±6dB

6.5 Oscillator Performance:

Phase error

<2° for burst frequency change of ±10Hz

<2° for burst level change ±6dB

<2° for ambient temperature change of 10°C

<2° if time relation of sync and burst moves anywhere within allowable FCC or CCIR regulatory range

Subcarrier lock in range

±200Hz (NTSC/PAL-M)

±300Hz (PAL)

7. SECAM PERFORMANCE

7.1 Luminance Channel:

Differential gain

Within 1% for a luminance from zero to 40 fL

Frequency response

Monochrome mode:

100Hz to 8MHz ±1dB

(aperture correction at zero)

Color mode (with notch filter):

Chrominance Filter removes frequencies in 4.25MHz and 4.406MHz (-3dB at 2.7MHz)

7.2 Chrominance Channel:

High frequency de-emphasis (Bell filter)

Error: 3.9MHz to 4.75MHz ±0.5dB

Drift: within ±20kHz at 4.286MHz

Limiting ratio

Greater than 30dB

Linearity of the demodulator

Less than 3% at ±350kHz

Demodulator center frequency stability

Within ±0.25kHz

Color range

Preset at zero dB

More than ±6dB

7.3 Chrominance/Luminance:

Rise time R-Y/B-Y

500 nsec at 25% modulation

Time error

Less than 40 nsec

Gain error

Less than 5%

Aperture correction

Adjustable continuously up to 6dB boost at 4.5MHz, 6.5MHz (selectable)

DC restoration

Back porch type

Back porch level:

Within 1% of peak luminance 10% to 90% APL

RY/B-Y Crosstalk >50dB

8. SYNCHRONIZATION

8.1 Sync Input Return Loss:

>46dB up to 7MHz

8.2 Vertical Hold:

Digital countdown systems

Free running frequency of oscillator:

Automatic { Mode 1: 42Hz to 50Hz
Mode 2: 50Hz to 60Hz

Stability of free running frequency:

within 1Hz

8.3 Horizontal Hold:

Free running frequency of oscillator

15.75kHz ±1kHz with H-hold control or

15.625kHz ±1kHz with H-hold control

Horizontal oscillator locking range

Pull in: ±500Hz

Holding: ±500Hz

Free running stability

within ±100Hz

AFC Time Constant

Two horizontal time constants are provided (0.64ms and 1.73ms)

8.4 Sync Stability:

On INTERNAL sync the stability of the raster shall be preserved under the following conditions:

Video Input Level: ±6dB about nominal

Picture level changes

+3dB to -40dB and sync level changes -6dB.

Line-sync white-noise immunity: 26dB

Field-sync white-noise immunity: 26dB

8.5 AFC:

Switchable (FAST/SLOW)

Slow AFC displays timing errors of incoming sync with a selected horizontal Time Constant of 1.73ms.

Fast AFC largely corrects for incoming timing errors with a selected horizontal time constant of 0.64ms.

8.6 Blanking Intervals:

Horizontal retrace time: 9μs

Horizontal blanking: Adjustable

Vertical retrace time: <0.6ms

Vertical blanking:

<15H for normal scan

Interlace:

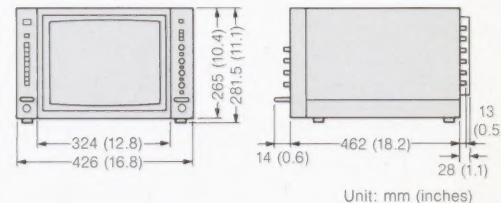
<11H for under scan

Better than 45/55

9. PHYSICAL CHARACTERISTICS

9.1 Weight: Approx. 31kg (68.3 lb)

9.2 Dimensions



9.3 Environmental:

Operating temperature range: 0°C to +40°C

Optimum temperature range: 20°C to +30°C

Humidity: 0 to 90% non-condensing

Altitude: 3,050m (10,000 feet)

9.4 X-ray Radiation:

• Complies with DHHS rules 21 CFR

Subchapter J sec 1020 10

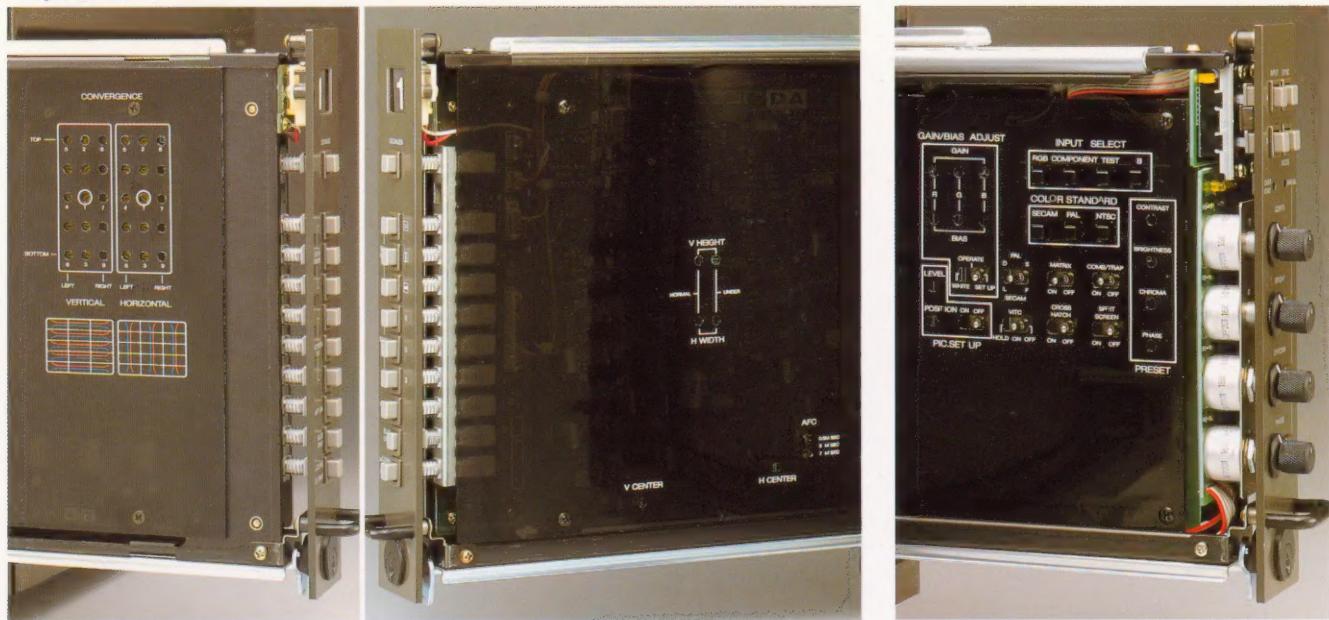
• PTB (for West Germany)

9.5 Electro Magnetic Compatibility:

• Complies with FCC rules part 15 (Computing Device Class A)

• Design and specifications subject to change without notice.

Adjustments in the Drawer



Optional Boards and Accessories



BKM-1420 (PAL)

Decoder Boards

- **BKM-1410** (NTSC, supplied with BVM-1310)
- **BKM-1420** (PAL)
- **BKM-1421** (PAL-M)
- **BKM-1430** (SECAM)

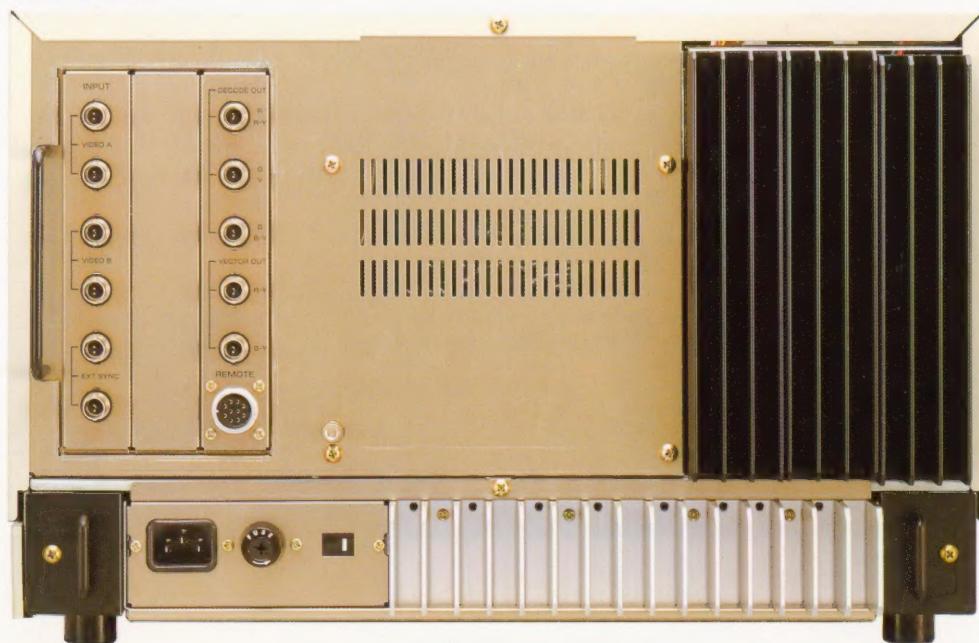


RGB/Component Adaptor

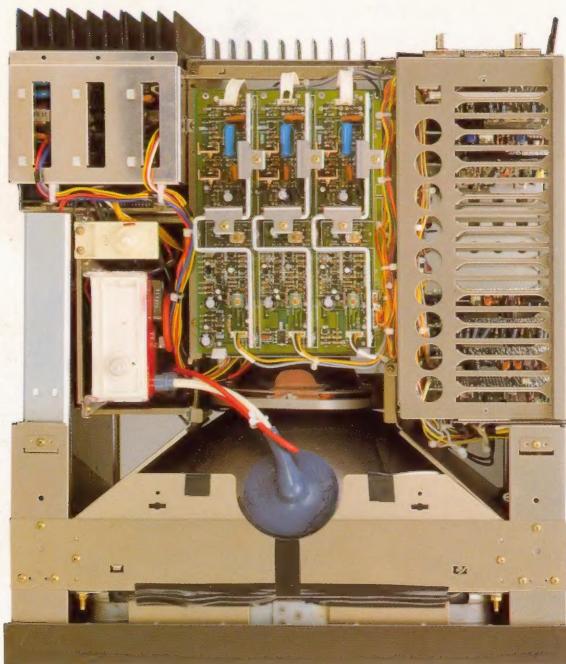
- **BKM-1440**

- **BKM-1411**
NTSC Comb Filter Adaptor
- **BKM-1460**
VITC Adaptor

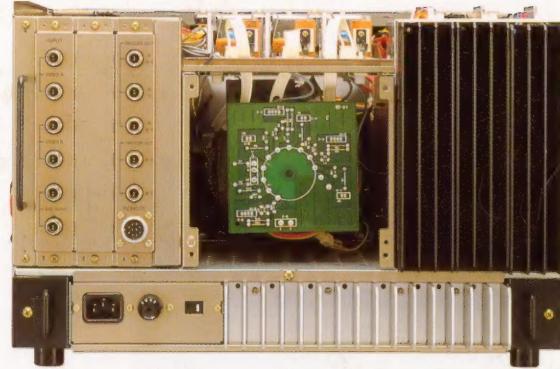
Rear Panel



Views of Inside



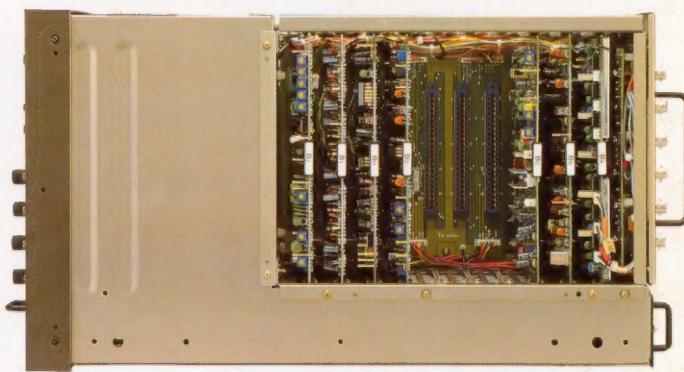
Upper View



Rear View



Left View



Right View

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